Orconectes (*Trisellescens*) *etnieri* Bouchard and Bouchard 1976

Ets crayfish

Photo by S. B. Adams.

Distribution and Habitat

Bouchard and Bouchard (1976) reported *Orconectes etnieri* from northcentral Mississippi and southwest Tennessee in tributaries of the Mississippi River, including the Hatchie (MS and TN), Loosahatchie (TN), and Forked Deer (TN) drainages, and in western tributaries of the Tennessee River from Robinson Creek, TN, northward to Snake Creek in Hardin and McNairy counties, TN. Fitzpatrick (2002) also reported *O. etnieri* from western tributaries of the Tennessee River in MS, and we have collected if from the Wolf River drainage, another eastern tributary of the Mississippi River, in Benton County, MS (MS crayfish database, this website). In addition, several specimens from headwaters of the Little Tallahatchie drainage (Yazoo basin) and the Town Creek drainage (Tombigbee basin) in MS have been tentatively assigned to *O. etnieri* based on morphology and preliminary genetic analyses (unpublished data and MS crayfish database, this website). To date, *O. etnieri* has been collected from the following Mississippi counties ("?" indicates identification uncertain): Alcorn, Benton, Lee (?), Marshall (?), Prentiss, Tippah, Tishomingo, and Union.

Orconectes etnieri lives in flowing streams and is often found in leaf litter in pools or runs (Bouchard and Bouchard 1976). The type locality was 1.8 – 4.6 m wide and 0.3 - 0.9 m deep (Bouchard and Bouchard 1976). Water clarity ranged from clear to slightly turbid. The substrate was sand with gravel in riffles, some small to medium sized rocks, and numerous leaf packs, and the riparian zone was mixed deciduous forest. The species also uses streams with clay substrate (MS crayfish database, this website).

Life Colors and Distinctive Characters

The following descriptions were adapted from Bouchard and Bouchard (1976). Carapace and abdomen mottled brown with a pair of dorsolateral, broken dark stripes originating

near the caudal margin of carapace and extending the length of the abdomen. Degree of mottling is variable. Color is lighter on anteriolateral surfaces of carapace. Rostral margins, postorbital ridges, and lateral margins of antennal scales darker than basic body color. Ventral surfaces white. Chelae are mottled to uniform brown dorsally, cream to white ventrally. Distal ends of fingers red in young and often orange or yellow in adults.

Rostrum with thickened, straight margins, converging distally, lacking marginal spines in adults, with distinct, concave, slender acumen terminating in very small, corneous, upturned tubercle. Rostrum relatively flat dorsally with slight impression basally and low, broad carina evident along flattened portion. Postorbital ridges terminating in acute, corneous tubercle. Areola open with 2 to 4 punctations across narrowest point. One cervical spine on each side of carapace and a small, acute branchiostegal spine. Antennal scale rounded with widest point just distal to midlength. Palm of chelae broad with two rows of tubercles along mesial margin and smaller tubercles scattered over dorsomesial half. Setal tufts over dorsal surface of palm. Well defined, longitudinal ridges on dorsal surfaces of fingers, and fingers terminating in large, acute, corneous tips. Form I males with simple hook on third pereiopod (leg). Moveable finger with distinct excision on basomesial margin. Gonopod with two terminal elements curving caudally at same angle to main shaft of appendage. Central projection corneous, tapering, and longer than mesial process. Latter non-corneous with distal end flared into shallow trough. Females have narrower chelae. Annulus ventralis symmetrical and firmly fused cephalically to the antecedent sternum that is marked by a nontuberculate, smooth caudal margin; cephalic portion elevated with shallow, longitudinal, median trough flanked by low ridges (sometimes lacking) that become transverse at midlength. Originating from centrally-located fossa is a "?"-shaped sinus. Postannular sclerite with rounded cephalolateral margins and straighter caudal margin to form roughly a half oval, about two-thirds as wide as annulus.

Size

The largest specimen available is a form I male with carapace length (CL) of 33.5 mm and postorbital carapace length (POCL) of 26.1 mm (US Forest Service collection). The smallest reported form I male had a CL and POCL of 18.4 and 13.9 mm, respectively (Bouchard and Bouchard 1976). Eight females with eggs or young ranged from 20.2 – 32.7 mm CL (14.5 – 25.7 mm POCL) (Adams In press).

Most Like

Distinguishing among species in the *Trisellescens* subgenus can be extremely difficult, especially given that several species remain undescribed and the phylogenetics of the subgenus is in disarray. In many cases, proper identification can be made only with form I male specimens. *Orconectes etnieri* is very similar to both *O. validus* and *O. chickasawae* with which its range appears to overlap slightly. Also similar are specimens possibly representing new species in the Tennessee and Yazoo basins in Mississippi.

Orconectes etnieri differs from *O. validus* in having both terminal elements of the gonopod recurving at the same rather than at different angles, and in *O. validus*, the

mesial process recurves more sharply, at about 90 degrees, than in *O. etnieri*. Also, the rostrum of *O. etnieri* is essentially flat as opposed to deeply excavate in *O. validus*.

Orconectes etnieri can be distinguished from *O. chickasawae* in having a wider areola that is less than 8 times as long as broad, as opposed to 16 times, and in having a longer split between terminal elements of the form I gonopod such that the central projection constitutes 30 % of the mesial length of the gonopod as opposed to less than 27 % (Cooper and Hobbs 1980). Also, in *O. chickasawae*, the terminal elements are more strongly recurved.

The *Orconectes (Trisellescens)* species that is widespread in the eastern portion of the upper Yazoo basin is either *O. chickasawae* or an undescribed species and has a gonopod typical of *O. chickasawae*, but often has a wider areola, more reminiscent of *O. etnieri*.

Orconectes etnieri has an open areola whereas that of *O. mississippiensis* is usually obliterated along part of its length. In *O. mississippiensis*, the terminal elements of the form I gonopod are more slender and longer such that the central projection constitutes 31.5 – 36.6 % of the length of the gonopod as opposed to 30% (Cooper and Hobbs 1980).

Life History

Orconectes etnieri apparently mates from fall to spring with females extruding eggs in late winter / early spring and juveniles becoming independent in late spring. Form I males have been collected from March to May and in July, August, and October (Bouchard and Bouchard 1976; MS crayfish database, this website). Bouchard and Bouchard (1976) collected two ovigerous females on 1 and 15 March, and I collected six ovigerous females, carrying 46 to 197 eggs, between 12 March and 6 April and two females with stage 1 hatchlings on 6 April (Adams In press). Female size was significantly correlated with fecundity but not with egg size. *Orconectes etnieri* is in the middle of the fecundity range for the subgenus *Trisellescens* (Adams In press). Juveniles were collected in February, May, July, August, and October, but no information about juvenile size is available (MS crayfish database, this website).

Crayfish Associates

Bouchard and Bouchard (1976) reported collecting the following Mississippi species with *O. etnieri*: *Cambarus diogenes, C. striatus, Procambarus ablusus*, *P. acutus*, *O. palmeri palmeri*, *O. validus*, and *O. wrighti*. Of the eight collections from Mississippi National Forest standardized stream sampling that contained *O. etnieri, P. vioscai* occurred in three, *C. striatus* in two, and no other crayfish species in four (unpublished data).

Conservation Status

American Fisheries Society ranking: Currently Stable
Heritage global ranking: G4 (apparently secure).
State of Mississippi: Tier 2 (in need of timely conservation action and/or research)(MDWFP 2005).
See (Taylor et al. 2007) for further explanation of American Fisheries Society and Heritage rankings.

Species Description

Bouchard, R. W. and J. W. Bouchard. 1976. *Orconectes etnieri*, a new species of crayfish from western Tennessee and northern Mississippi with notes on *Procambarus ablusus* and *Orconectes wrighti*. Proceedings of the Biological Society of Washington **88**:459-468.

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